

important subject; hence it is hoped that these experiments will be useful in the study of the dependence of the earth's temperature on radiation.

(2) Spectrobolometric measurements of the solar constant of radiation have been continued at the Mount Wilson Observatory in California. As in former years, evidences of a fluctuation of solar radiation were found in the results of the measurements thus far obtained. A new and improved standard pyrheliometer was found to be more satisfactory than the one used in 1906, and great confidence is felt in the results obtained with it. Efforts have also been made to carry the bolometric measurements much farther in the ultra-violet through the use of a large quartz prism, a large ultra-violet glass prism, and two magnalium mirrors.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The special board for biology and geology has appointed Mr. Leonard Doncaster, of King's College, to be superintendent of the Museum of Zoology, and the Vice-Chancellor has approved of the appointment.

GLASGOW.—Principal Sir Donald MacAlister, K.C.B., has been appointed to represent the Senatus of the University at the centenary festival of the University of Berlin in October next.

A scheme for the formation of a clinical branch of the medical school of the University, to be situate at the Royal Infirmary, was approved by a Parliamentary Commission, after a two days' hearing, on April 1. The provisional orders for the purpose contemplate the establishment of four professorial chairs at this infirmary, in addition to those held at the Western Infirmary, namely, those of medicine, surgery, obstetrics, and pathology. The necessary funds, amounting to about 2000*l.* a year, are provided for from existing endowments and by grants from St. Mungo's College, the Muirhead trustees, and other benefactors. All the instruction thus provided will be open to women students of the University as well as to men.

THE late Colonel G. E. Church, who died on January 4, bequeathed 1000*l.* to the Royal Geographical Society towards a fund for the enlargement of its premises or towards a new building for its use. He left to Harvard University his collection relating to North and South America, consisting of books of travels, voyages, explorations, boundary-line questions, geography, ethnology, and history, as well as all writings by Latin and American authors, to be known as the "George Earl Church Collection." Should the authorities of the University not accept this gift within four months of his death, then the collection is to be offered to the Brown University, Rhode Island, or the Stanford University, in California.

In Class iv. (Education, Science, and Art) of the Civil Service Estimates for the year ending March 31, 1911, the estimate amounts to 18,651,483*l.*, a net increase of 697,718*l.* on the amount voted in 1909. The estimate for the Board of Education shows a net increase of 417,663*l.*, of which 348,775*l.* arises under the subhead of grants in respect of public elementary schools, &c. A sum of 200,000*l.* is again provided for special grants to certain necessitous local education authorities. The estimate for scientific investigation, &c., includes a grant of 7500*l.* in aid of the expenses of the aeronautical section of the National Physical Laboratory, and a grant of 20,000*l.* in aid of the expenses of the British Antarctic Expedition of 1910.

THE following courses of free advanced lectures have been arranged by the University of London:—a course of five lectures on "Fertilisation and Related Phenomena," to be given by Prof. J. B. Farmer, F.R.S., at the Royal College of Science, on Wednesdays at 5 p.m., beginning on April 27; a course of five lectures on "The Anatomy of Plants in Relation to External Conditions," to be given by Mr. L. A. Boodle at University College on May 26, May 30, June 2, June 6, and June 9, at 5 p.m. A course of three lectures on "The Geology and Geography of Charnwood Forest" will be given by Prof. W. W. Watts,

F.R.S., at the Imperial College of Science and Technology, on Mondays at 5 p.m., beginning on April 25. The lectures are addressed to advanced students of the University and to others interested in the subjects. Admission is free, without ticket.

THE difficulty of reaching the cultivator of the soil for any educational purpose has not as yet been overcome in any country, and certainly not here. Some interest, therefore, attaches to a scheme that has been at work in the West Indies for about eighteen months, and has proved so effective that it is to be adopted permanently. Courses for home reading are drawn up, divided into three parts, at the end of each of which are held examinations known respectively as the preliminary, the intermediate, and the final. The preliminary examination requires a general all-round education, and is dispensed with in the case of students who possess certain qualifying certificates. The intermediate examination requires such knowledge of the general principles of agriculture, and of planting work in particular, as might be expected from an intelligent overseer of a few years' experience, while the final examination reaches the standard necessary for a man capable of managing an estate. A leaflet is issued by the West Indian Agricultural Department containing a syllabus of the subjects necessary for each part, with hints as to what books should be read. In addition, the *Agricultural News*, the fortnightly paper issued by the Department, devotes nearly a page in each issue to notes bearing on the current work of the estate, thus giving the necessary practical illustrations of the general principles set out in the textbooks. A few questions are also set which students are advised to attempt. The Department, however, does not set up to act as a correspondence college and correct the answers to the questions. It is left to the student to find someone who will discuss his work with him and help him over those hard places where a man, reading on his own account without any assistance, inevitably gets stranded sooner or later. At first the officers of the Department gave a good deal of help by organising students' meetings where difficulties could be discussed; voluntary workers also came forward. The examinations are conducted by the staff of the Department, acting in conjunction with some of the planters. The intermediate and the final are essentially technical in their nature; the candidate is expected to be a better man at field or plantation work as a result of his reading, and he must demonstrate his superiority to the satisfaction of the planters on the examining board. In this way the interest and sympathy both of masters and of men can be enlisted, and both are brought to realise that the certificates awarded indicate increased efficiency on the part of the holder. Interest in the scheme is said to be spreading among the cultivators, while the organisers have found certain modifications that will still further increase its utility. It will be carefully watched by those in this country who are engaged in elementary agricultural education.

THE National Union of Teachers held its conference this year at Plymouth during Easter week. Naturally, most of their discussion was confined to various aspects of elementary education, but other subjects of national importance were also considered. Mr. Marshall Jackman, the president, was chiefly concerned with a demand for more money from the Treasury for elementary education, to relieve the financial straits in which many local education authorities find themselves. Mr. Jackman contended that we build Dreadnoughts regardless of cost, not because we want them, but because we feel the necessity of keeping pace with our neighbours. If we could have a similar cry in education to the Two Power standard cry for the Navy we should be able to do much for educational progress. He set out a national educational standard which he thought was worthy of this great Empire. Is it too much to demand that the educational opportunities for British boys and girls shall be no less than those for the children of any other nation? His new standard was that all forms of education should be as free to the British child as to the American child, the elementary schools of Britain should be manned by teachers no less efficient than those in the schools of Sweden, the classes of the schools in Britain should be no larger than those of Den-

mark, and the health of the children in this country should not be less cared for than that of the children in German schools. The care of adolescents came in for careful debate. Sir Henry Hibbert, chairman of the Lancashire County Education Committee, said the duty of providing further discipline and training for all children during the years which follow the day-school period is receiving attention in many countries, all of which seem to be moving towards three conclusions:—(1) that increased effort should be made by the State to compel local authorities to organise, according to the needs of different localities and of different trades, courses of instruction useful to any child, and so planned as to train them for healthy living and for the duties of citizenship; (2) that there should be a further delimitation of the hours of juvenile labour; and (3) that all employers, Government as well as private, should be compelled by law to enable any persons of less than seventeen or eighteen years of age employed by them to attend courses of instruction, general or technical, for a specified number of hours per week at times during which the pupils would not be too tired to profit by the instruction. Dealing with the same subject, Miss Adler, of the London County Council, explained that the aim of the trade schools of the London County Council is not entirely to supersede apprenticeship, but to reduce the period of indenture, and to enable the lad to enter the workshop already equipped to take an intelligent interest in workshop processes, to handle tools effectively, and to be in a better position to learn by observation than the lad who enters the workshop direct from school. The development of handicraft side by side with the general intelligence is the primary aim of the trade school, and when this is possible on practical lines postponement of entry into the workshop is a distinct advantage, more especially when the trade side of the work is to some extent supervised by members engaged in the industry taught in the school. It was pointed out during the conference that the cost of compulsory attendance between fourteen and seventeen would be some 2,625,000*l.*, and if the age were increased to eighteen 3,500,000*l.*

SOCIETIES AND ACADEMIES.

LONDON.

Royal Microscopical Society, March 16.—Prof. J. A. Thomson, president, in the chair.—Miss L. S. M. Summers: Antipatharians from the Indian Ocean. Fourteen species were dealt with, including three which are new, viz. *Cirripathes indica*, *Antipathes salicoides*, *Pteropathes simpsoni*. In several cases the presence of well-preserved polyps made it possible to remove some of the doubts which Brook expressed in regard to various species. The paper referred also to certain peculiarities in the polyps and spines. The collections were made at Ibo, in Portuguese East Africa, and in the Mergui Archipelago.—E. M. Nelson: The visibility of the tertiaries of *Coscinodiscus asteromphalus* in a balsam mount. The author directed attention to the continued improvement in microscope objectives, and particularly to a new $\frac{1}{4}$ -inch objective by Zeiss. Twelve years ago he received a slide of Nottingham deposit mounted in sulphide of arsenic, and he then saw, for the first time, the tertiaries in *Coscinodiscus asteromphalus*. He had had a balsam mounted selected slide of this diatom since 1876, and had tested hundreds of objectives upon it, but these tertiaries had never been visible. Recently he received from Messrs. Zeiss a long tube $\frac{1}{4}$ -inch apochromatic object-glass of N.A. 1.4, and it was tested on this balsam-mounted slide. The tertiaries which had for so many years eluded the grip of all kinds of lenses were conspicuous. This apochromatic $\frac{1}{4}$ -inch was more sensitive to tube length, stood a larger axial cone, bore a deeper eye-piece, and had sharper definition than any microscope lens he had previously seen.—A. A. C. Eliot Merlin: The measurement of the diameter of the flagella of the cholera bacillus prepared by Löffler's method. Slides of bacteria are prepared by Löffler's method to render the flagella more easily demonstrable, as the organism and its appendages are greatly distended by the process, thus rendering them comparatively coarse objects. Little has been attempted

as regards the measurement of these appendages since Dr. Dallinger read his paper on the measurement of the diameter of the flagella of *Bacterium termo* in 1878. The author of the paper obtained his results by what are termed extinction measurements, the resulting measurements being for the finest flagella $\frac{1}{64725}$ -inch and for the coarser $\frac{1}{62226}$ -inch. He checked these results by measuring, by means of a filar micrometer, the flagellum of a selected specimen, the measurement by this method giving a diameter of $\frac{1}{66756}$ -inch as against $\frac{1}{64725}$ -inch of a flagellum of approximately similar fineness measured by the extinction method.

Geological Society, March 23.—Prof. W. W. Watts, F.R.S., president, in the chair.—L. Moysey: *Palaeoxyris* and other allied fossils from the Derbyshire and Nottinghamshire Coalfield. After reviewing the bibliography of *Palaeoxyris*, the author records the finding of twenty-two specimens from Shipley Clay-pit (Derbyshire) and above 130 from Digby Clay-pit (Nottinghamshire), also several isolated examples from other localities in the district. He describes *Palaeoxyris helicteroides* (Morris), noting especially the presence of a "beak," which had not hitherto been adequately described. He then describes *Palaeoxyris prendeli* (Lesquereux) from Shipley Clay-pit, again noticing the formation of the "beak." The discovery of *Palaeoxyris johnsoni* (Kidston) from Digby is noted, and it is proposed that this fossil be removed into the genus *Vetacapsula*. The author also describes a specimen of *Vetacapsula cooperi* (Mackie and Crocker) from Newthorpe Clay-pit (Nottinghamshire).

CAMBRIDGE.

Philosophical Society, March 14.—Prof. Bateson, president, in the chair.—Sir J. J. Thomson: The cause of the phosphorescence of the glass in vacuum tubes when the pressure is not very low.—J. A. Crowther: Transmission of β rays.—J. L. Glasson: Secondary X-rays from metallic salts. These experiments show that the absorption coefficient of the secondary homogeneous X-rays from the metals of the chromium-silver group is unaffected by the combination of the metal with certain acid radicles. The only effect of the combination is the superposition of a small quantity of hard scattered radiation on the homogeneous radiation of the metal. Moreover, the valency of the element has no influence on the secondary homogeneous radiation from it. The absorption coefficient of the characteristic radiation from manganese is deduced from the absorption curve of manganese sulphate.—S. G. Lusby: Some experiments on ionisation in dried air. All the known properties of ions have been found to vary with the amount of moisture present in the gas experimented on, but in all cases the negative ion is the more susceptible. Hence it was thought that if the gas were dried, it should acquire a positive charge. The experiment was therefore tried, liquid air being used as the drying agent. On testing a stream of air which had been ionised and then dried, no indication of electric charge was detected. By using another method, it was found that both the positive and the negative ionisation are increased greatly by this drying action, but in an equal ratio, which in some cases amounted to ten. This was found to be due to decreased re-combination. The effect could be eliminated by previously filtering the air.

DUBLIN.

Royal Dublin Society, March 22.—Mr. R. L. Praeger in the chair.—Prof. T. Johnson and Miss R. Hensman: Agricultural seeds and their weed impurities; a source of Ireland's alien flora. The first-named author stated that as under the Weeds and Seeds Act for Ireland he had ceased to be responsible for the seed-testing station of which he had been director during the ten years of its existence (1900-9), the paper he communicated gave a summary of the purity and germination percentage of the 11,000 samples of seeds already tested, and of the weed-seeds found in these samples. Utilising the results of Dr. Stebler's investigations, he showed how many of the weed-seeds serve as source-indicators of the agricultural seeds sold. The paper contains also a list of casuals already recorded in the Irish flora, so far as these are traceable to introduction in seed. A list of 120 weed-seeds is given, 75 per cent. of which are the seeds of non-indigenous weeds.